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MULTI-LAYER MATTRESS COVER MATERIAL
[MEHRSCHICHTIGER MATRATZENBEZUGSSTOFF]

BODET & HORST INC.

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Multi-layer Mattress Cover Material

The technical innovation involves a multi-layer mattress cover material.

The surfaces of modern mattress cores are spot-elastic or segment elastic. They are only - locally limited - compressed there where a pressure stress exists. A spot-elastic mattress surface nuzzles the contours of the reclining body, produces a broad pressure distribution, and prevents pressure peaks.

Furthermore, a mattress surface must also be breathable; in other words, it can only influence the introduction of fresh air and the removal of body moisture to such a slight extent that the oxygen partial pressure and the air humidity near the skin remain within physiological tolerance limits. The latter condition applies to all mattresses regardless of their area of application.

The physiological characteristics of foam material mattresses are enhanced by coverings of natural materials which oftentimes are quilted with a base of natural fibers

or hollow fibers. The disadvantage of this construction is, on the one hand, the time consuming processing and, on the other hand, the limitation of the spot elasticity of the mattress core because of the overlays and coverings in a form that reduces reclining comfort, depending on the improvement of the physiological characteristics and vice versa.

The technical innovation has the object of constructing a mattress covering so that it can be produced simply and at a favorable cost and thereby facilitates an exceptional

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climatization of the reclining surface.

This underlying object of this invention is made possible by the tenet of the characterizing part of the main claim.

In the process, a spacing knitted fabric produced at low cost is combined with a surface facing the user's top side and a filling placed between the spacing knitted fabric and the surface which, depending on need, offers a higher or lower heating insulation; in other words, it can be adjusted in a simple manner both for summer use as well as

winter use whereby the filling possesses both heat and moisture regulating properties.

Advantageous embodiments of the invention are explained in the sub-claims.

It is thereby advantageous, when the surface is produced from wool or other natural materials friendly to the skin, in order to ensure an especially high reclining comfort.

An ideal production of the filling results when stuffers are used that can be produced from artificial or natural materials or a combination thereof.

An especially simple and cost effective production of the mattress cover material is attained when a sub-layer is formed between the filling and the spacing knitted fabric, so that the combination of the surface, sub-layer, and filling can be constructed as a compound substance (and thus, for example, a double fabric results that features a filling and that can be combined in a simple manner with a

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spacing knitted fabric).

It is possible to glue the lower layer with the spacing knitted fabric so that, again, a low cost manufacture is facilitated whereby there should again be a water vapor porosity between the spacing knitted fabric and the layers placed above.

In an advantageous embodiment, the spacing knitted fabric features two surfaces constructed at a distance and parallel to each other in order to attain, by means of this construction, an excellent moisture regulation and thus an improved micro-climate of the mattress.

By means of a separation layer between the surfaces of the spacing knitted fabric constructed at a distance, an intense air and moisture exchange is facilitated within the spacing knitted fabric whereby the micro-climate of the mattress should be improved. A low cost construction of this separation layer is attained, when one or several spacing filaments hold the surfaces of the spacing knitted fabric to be spaced apart from each other at a distance, whereby these spacing filaments can be constructed, for example, as bending-resistant monofilaments.

A cost effective construction of the spacing knitted fabric enabling an exceptional micro-climate is attained when both the surfaces, as well as the spacing filaments, are made of a polyester material.

An embodiment of the invention is shown in the drawing, which depicts a mattress cover material in an (enlarged) cross-sectional view.

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The mattress cover material 1 thereby features a surface 2 which is constructed on the user top side of the mattress cover material 1; in other words, in the case of being used, the user lies directly on this surface 2. In this embodiment, the surface 2 consists of a cotton cover; however, it can of course consist of other suitable skin-friendly natural materials or other artificial skin-friendly materials. Below this surface 2, a filling of stuffers is provided, which possess heat and moisture regulating properties and again can be made of natural and/or artificial materials, and, for example, also of hollow fibers. The heat conductance capability can be regulated by the material use, type, and strength of the stuffers 3. It is thus also possible to attain an effective heat and summer side with the same climatizing, spacing

knitted fabric exclusively via different fillings. A sub-layer 4 or bottom side is provided below the stuffers 3 in this embodiment, which again in this embodiment are made from polyester material and again are water vapor permeable. The surface 2, the filling, as well as the sub-layer 4 can be combined as a compound material 5 which is connected with a spacing knitted fabric 6, for example, via an adhesive layer 7, whereby the type of adhesive is selected so that the adhesive layer is water vapor permeable and guarantees an unimpeded moisture exchange. The connection of the sub-layer 5 or the compound material 5 with the spacing knitted fabric 6 can also be made via any other type which is suitable, for example, sewing.

The spacing knitted fabric features a top side 8 and a bottom side 9 which are held at a distance from each other by a spacing layer 10. This occurs via one or more spacing filaments 11, which are advantageously made of a bending-resistant monofilament. The two surfaces of the spacing knitted fabric, namely the top side 8 and the bottom side 9,

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are thereby constructed parallel to each other, whereby the top side 8 and the bottom side 9 represent, in an advantageous embodiment, knitted fabrics of polyester

filaments. The precisely defined separation of the upper and bottom side of the spacing knitted fabric 6 amounts in this embodiment to about 4 mm, and the spacing filaments 11 ensure that under normal stress and despite deformation of the foam material core of the mattress, the separation between the top and bottom side of the knitted fabric is kept almost constant. The spacing filaments 11 fill a maximum of 20 % of the area in the separation layer 10, which causes an unimpeded air exchange to be possible in this layer and also an overall air exchange between the compound material 5 and the spacing knitted fabric 6.

In the process, it must be considered that the spacing knitted fabric 6 exhibits a one to three times higher heat conductance capability in comparison to foam. Thus, a part of the body heat can be conducted via the air into the spacing layer 10, which is a desirable characteristic in summer or in warm sleeping areas. On the other hand, the heat conductance can also be regulated by the construction of the compound material 5, as well as - as previously reported - by the material use, type, and strength of the stuffer. It is thus possible to realize an effective summer and winter side with the same climatizing spacing knitted fabric exclusively via different compound materials or

different parameters of the component parts of the compound material 5.

The water vapor permeability of the top side of the spacing knitted fabric, which can consist of polyester, is about five times higher than the foam of the mattress or the mattress core 12. That means that the cotton fibers of the compound material 5 can release moisture on the spacing knitted fabric 6 without problems when the required

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saturation is attained, where a compensation of the moisture in the area of the spacing layer 10 can occur.

In the construction shown, the air permeability of the top side of the spacing knitted fabric 6 and the adhesive layer 7 is so high that an additional aeration of the reclining surface (the compound material) can occur from below. It is thereby avoided that any moisture occurs on or in the foam core, which could result in the formation of bacteria or fungus.

An essential advantage of the proposed mattress cover material is that it can be produced simply and cost effectively and, in the embodiment depicted, is not

stronger than approximately 7 to 8 mm at any spot. As a result, washing and, also, - for a comparable embodiment - removal from the mattress is eased, even if the mattress cover material is to be washed at home in a customary washing machine for private use.

By means of the use of a double surface knitted fabric (compound material 5), which is connected with the spacing knitted fabric 6, it is simply, cost effectively, and also very practically made possible that the mattress cover retains its excellent climatizing properties.

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Patent Claims

1. Mattress cover material, characterized by a surface (2) which is water vapor permeable facing the user top side, a filling with heat and moisture regulating characteristics placed underneath, and a spacing knitted fabric (6) placed under it.
2. Mattress cover material according to Claim 1, characterized by the surface (2) being made of cotton material.
3. Mattress cover material according to Claim 1 or 2,

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characterized by stuffers (3) as the filling.

4. Mattress cover material according to one of the prior claims, characterized by a sub-layer (4) formed between the filling and the spacing knitted fabric (6).
5. Mattress cover material according to one of the prior claims, characterized by a sub-layer (4) made of polyester material.
6. Mattress cover material according to one of the prior claims, characterized by a surface (2), a filling, and a sub-layer (4) forming a compound material (5).
7. Mattress cover material according to one of the prior claims, characterized by a gluing of the sub-layer (4) with the spacing knitted fabric (6).
8. Mattress cover material according to one of the prior claims, characterized by the spacing knitted fabric (6) consisting of two surfaces formed parallel to each other and adjacent.
9. Mattress cover material according to Claim 8, characterized by a spacing layer (10) between the two surfaces of the spacing knitted fabric (6) in which at least one spacing filament (11) defining the separation is constructed.
10. Mattress cover material according to one of the prior claims, characterized by the spacing knitted fabric (6) basically formed from polyester material.

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